Effect of chloride concentration in soil on reinforcement corrosion

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Abstract: This paper presents results of a study conducted to evaluate the effect of chloride concentration in soil on corrosion of reinforcing steel in concrete. Concrete specimens prepared with Type I, Type V and silica fume cements were exposed to soil with a chloride concentration of up to 3%. The effect of chloride concentration in soil on corrosion of reinforcing steel was evaluated by measuring corrosion potentials and corrosion current density. After 18 months of exposure, the concrete specimens were broken and the extent of corrosion of the reinforcing steel was examined and the gravimetric weight loss due to corrosion was assessed. As expected, the degree of corrosion increased with the chloride concentration in the soil. The type of cement also influenced the extent of reinforcement corrosion. For a particular chloride concentration, least reinforcement corrosion was noted in the silica fume cement concrete followed by Type I and Type V cement concrete. Based on the data developed in this study chloride threshold values in soil for the three types of cements investigated are suggested.